



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

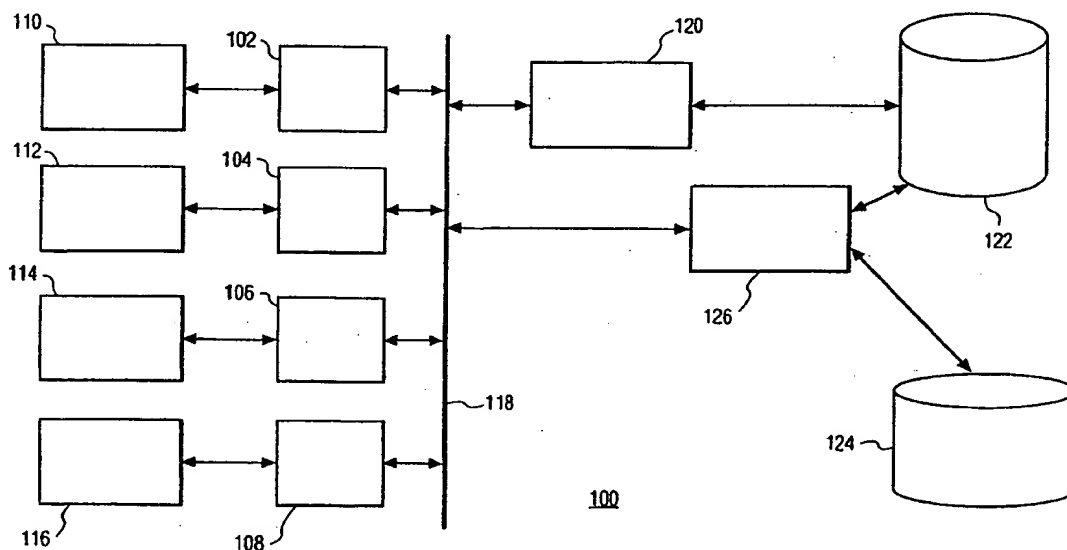
(51) International Patent Classification <sup>7</sup> : <b>G06F 17/30</b>	<b>A1</b>	(11) International Publication Number: <b>WO 00/28436</b> (43) International Publication Date: 18 May 2000 (18.05.00)
--	-----------	--

(21) International Application Number: PCT/EP99/08332

(22) International Filing Date: 1 November 1999 (01.11.99)

(30) Priority Data:  
09/189,535 10 November 1998 (10.11.98) US(71) Applicant: KONINKLIJKE PHILIPS ELECTRONICS N.V.  
[NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven  
(NL).(72) Inventor: SHTEYN, Yevgeniy, E.; Prof. Holstlaan 6,  
NL-5656 AA Eindhoven (NL).(74) Agent: HOEKSTRA, Jelle; Internationaal Octrooibureau B.V.,  
Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).(81) Designated States: CN, JP, European patent (AT, BE, CH, CY,  
DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT,  
SE).**Published***With international search report.**Before the expiration of the time limit for amending the  
claims and to be republished in the event of the receipt of  
amendments.*

(54) Title: UPGRADING OF SYNERGETIC ASPECTS OF HOME NETWORKS



## (57) Abstract

A server has access to an inventory of devices and capabilities on a user's home network. The inventory is for example a look-up service as provided by HAVi or Jini architecture. The server has also access to a data base with information of features for a network. The server determines if the synergy of the apparatus present on the user's network can be enhanced based on the listing of the inventory and on the user's profile. If there are features that are relevant to the synergy, based on these criteria, the user gets notified.

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LJ	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

Upgrading of synergetic aspects of home networks.

The invention relates to a method of customizing a network of an end-user, in particular to enabling the user to customize his/her consumer electronics equipment configured in a home network.

5 The Internet has given rise to several key market trends. These include the phenomenal, continued growth rates in Internet usage, with 30% of the US population online in 1998, a 75% increase over the year before. As more users emerge, their profiles are changing significantly. Today's average user has lower income and education levels than the average user of 2 years ago. Access devices are also changing, with International Data Corporation (IDC) projecting that the number of non-PC Internet enabled devices are likely to  
10 outnumber PC's inside of 7 years. Dataquest also projects that the growth rates for every class of non-PC Internet enabled device will outstrip growth rates in PC sales between now and 2001. Further, Internet enabled devices have come to rely on networks for new and exciting services.

15 Web-TV of Philips Magnavox is an example of a device that supports such an exciting synergy between the conventional TV on the one hand and the Internet on the other. The Philips Magnavox WebTV Plus Receiver offers a WebPIP (picture in picture) feature. Users can watch a television program simultaneously while maintaining a connection to the Web, even if their television set does not have PIP capability. This enables, for example, watching a TV show and being able to retrieve your E-mail at the same time without ever  
20 having to leave the living room couch. The receiver comes with an Electronic Program Guide (EPG) that allows users to receive text and video information about all the programs available on their TV system. The EPG is updated daily from the Web. The EPG is continuously available to the user while offline. Further expanding users' online capabilities, the integrated WebTV Crossover Links feature provides instant access to Web sites when users click on  
25 embedded links in television programs or commercials. For example, one could watch a TV documentary on the space program and simultaneously link up to the NASA Web site for additional information on a specific topic. Or, consumers shopping for a new car could click on the Web site link in an advertiser's TV commercial and instantly get more information on availability, options, and local dealers. Flash memory storage permits on-touch field

upgradability of the on-board software and the downloading of new applications from the Internet in order to ensure constant compatibility with the ever-evolving technology.

Value is migrating from the device to the Network and Network Applications. The growth of the Internet into a ubiquitous medium, coupled with the convergence of PC and TV, will result in new products which have both PC and CE functionality but which also have a third component which is termed "connected functionality". An example of such a convergence product is the DVX8000 of Philips Electronics. Networked or interconnected products will come to replace the idea of separate stand-alone products. This will have two significant consequences. A first consequence is that value to a consumer will shift from being "device-centric" to being "functionality-centric" or "task-centric". Voicemail is a good example of this. The access device is unimportant and the value of the messaging system is in the network. A second consequence is that the emphasis of the effort in the sales market to win the consumer's preference will change. With every device being connected or interconnected, bandwidth into the home increasing, and vast amounts of data made easily accessible, the new focus of an enterprise's effort is believed to be the interface with the consumer.

Home networking is another emerging trend in consumer electronics (CE) and in the computer industry. A number of initiatives, such as HAVi, Home API, and Jini, provide solutions for interconnectivity of home devices.

HAVi stands for Home Audio/Video interoperability. A consortium of consumer electronics manufacturers, among which Philips Electronics, has been working on specifications for a core of API's (application programming interfaces) for digital consumer electronics appliances in a home network so as to provide a standard for the audio/video electronics and the multimedia industries. An API specifies the method required for making requests to an operating system or application program. The home network is considered a distributed computing platform. The primary goal of the standard, referred to as the HAVi architecture is to ensure that products of different vendors can interoperate, i.e., cooperate to perform application tasks. HAVi has a functionality called "Registry" that registers the software representations of the devices and services in the HAVi-network.

Home API, also an initiative involving Philips Electronics, is a set of COM-based (Component Object Model) software services and API's to enable Windows applications to discover and control home devices in a protocol- and network-independent manner. The devices are modeled as OLE Automation software objects that use properties to expose device controls. Home API requires the devices to register with a look-up service called the "Directory" which is a searchable inventory of the software objects available.

Jini of Sun Microsystems, Inc., is a technology of networking devices. Jini is a Java-based software architecture that assists in networking computers and devices. When plugged into a network, a Jini-enabled device will broadcast its presence. Network clients that are ready to use that device can request the necessary software from the device, bypassing a server or a network administrator. This architecture builds on top of an existing network. The network itself is assumed to have been configured in advance. Jini has a look-up service that maps interfaces indicating the functionality provided by a service to a set of objects that implement the service.

For more information on HAVi, the use of COM technology and OLE Automation objects, Jini, or customized upgrading, reference is made to the following patent documents, incorporated herein by reference: the publicly available specifications of the HAVi architecture (e.g., version 0.86), of the Component Object Model Specification (e.g., version 0.9), the Jini Architecture overview of Sun Microsystems, Inc. (including the Java Remote Invocation Specification, the Java Object Serialization Specification, the JavaSpaces Specification, etc.) and to U.S. Serial No. 09/146,020 (Attorney Docket PHA 23,492), filed 9/2/98 for Yevgeniy Shteyn, for "LOW DATA-RATE NETWORK REPRESENTED ON HIGH DATA-RATE HAVi-NETWORK"; U.S. Serial No. 09/165,683 (Attorney Docket PHA 23,483), filed 10/2/98 for Yevgeniy Shteyn for "CALLS IDENTIFY SCENARIO FOR CONTROL OF SOFTWARE OBJECTS VIA PROPERTY ROUTES"; U.S. Serial No. 09/165,682 (Attorney Docket PHA 23,484), filed 10/2/98 for Yevgeniy Shteyn for "CONTROL PROPERTY IS MAPPED ONTO MODALLY COMPATIBLE GUI ELEMENT"; U.S. Serial No. 09/107,525 (Attorney Docket PHA 23,438), filed 6/30/98 for Yevgeniy Shteyn and Gregory Gewickey for "DYNAMIC DE-REGISTERING OF DEVICES IN SYSTEM WITH MULTIPLE COMMUNICATION PROTOCOLS"; and U.S. Serial No. 09/160,490 (Attorney Docket PHA 23,500) filed 9/25/98 for Adrian Turner, Simon Pearce, David Eves and Allan Timms for "CUSTOMIZED UPGRADING OF INTERNET-ENABLED DEVICES BASED ON USER-PROFILE".

The inventor has realized that CE devices connected to home computer(s), WebTV, and set-top boxes are capable of determining capabilities not only for their host, but also for the home network as a whole. While interacting with the host's lookup services, such as the Registry in HAVi, and the Directory of Home API, software components associated with the CE devices have access to a specific object in the home network and to information about the system's topology, types of connected devices and external connectivity options.

Within this context, reference is also made to U.S. Serial no. 09/133,622 (Attorney docket PHA 23,488) filed 8/13/1998 for Lawrence Freeman for "HOME-NETWORK AUTOCONFIGURATION", herein incorporated by reference. This document relates to the automatic configuration of PC's in a (home) network in order to share resources registered at the individual PC's. Services and resources local to one PC are registered with the other PC and vice versa. The registry hides whether a service or resource is remote or local. In operational use of the network, a resource or service local to one PC is addressable from the remote PC as if it were local to the latter. A home network of PC's is configured automatically in this manner.

It is an object of the invention to further enhance the Internet services in view of the proliferation of Internet-enabled devices and ubiquitous connectivity. It is another object to let the user of consumer electronics devices benefit from the Internet in a novel manner.

To this end, the invention provides a method of enabling customizing a home or office network of an end-user. In the preferred embodiment, the method comprises: receiving a profile of the network; receiving a profile of the end-user; receiving information about an item for use with the network; determining if the item is relevant to the end-user based on the network profile and/or the user-profile, and if relevant, enabling notifying the end-user of the option to select the item for being installed on the network. The profile of the network preferably includes an inventory of the devices available in the network; an inventory of their functionalities and capabilities; an inventory of software components and communication protocols used in the network; the synergetic aspects already being used among devices and components, etc. The user profile includes, e.g., fields of interest, preferences as to radio and TV programs and home entertainment, those of other members of the household, geographic area or ZIP code, preferred time frames, etc. The information about items for being added to the end-user's network is supplied, for example, by CE software and hardware manufacturers, importers, wholesale distributors. Alternatively, or supplementarily, maintaining or contributing to such an information base or server system is also of interest to independent enterprises, on-line magazines or editorial boards with experts and evangelists in the home entertainment fields. An email news group could have its own impact on the information base, thus contributing to user awareness of what is possible with his/her equipment.

In other words, the invention enables informing the user about customizing his/her network by enhancing the synergy between the components connected through the

network, through adding software items, hardware items or both, or by clarifying to the user possibilities inherent in the network as is. Short communication channels to the end-user are an important aspect, as well as efficient, relevant and a userfriendly notifications. Internet enabled devices may get email notifications or the user may be enabled to connect to a service provider's home page to get the personalized information.

The expression "end-user's network" as used herein indicates in particular, but not exclusively, the collection of the user's equipment components whereof are capable of interacting in a meaningful manner, in addition to serving a stand-alone function.

In case the feature relates to new software, it can be downloaded via the Internet for, preferably automatic, installation on the user's home network or office network. In case the feature comprises a hardware component, it can be shipped to the end-user upon acceptance of the offer. A help-desk service is preferably provided through the Internet to help the end-user install the feature.

The invention is based on the insight that network-enabled equipment will become a flexible repository into which the end-user can place new and exciting features over time dependent on the user's needs or desires, context of use, advancement of technology, etc. Not all end-users are always interested in all possible features for creating enhanced functionality of the equipment. Accordingly, a user-profile is established, either when the user registers his equipment with the notification service, or dynamically as a consequence of the user's interaction with the server system, or through a combination thereof. The profile is used to select technical features that are likely of interest to the user. In this manner, the user is kept abreast of the latest trends of interest to him/her. The invention implicitly supports virtual recycling as equipment needs to be designed for the purpose of being upgraded. The modular approach of adding or deleting technical software or hardware features as needed thus assists in slowing down the trend that products becoming obsolete fairly quickly, but without barring the manufacturer or aftermarket sales organizations from continuing doing business.

The invention is also based on the insight that intelligence on the network is typically ambient and needs only to be orchestrated to create meaningful synergetic results. Roughly, the number of synergetic aspects increases with the increase of the number of hardware and software functionalities and capabilities in the network. That is, the more components there are available, the higher is the likelihood that there are components that can cooperate such that the total effect is greater than the sum of the individual effects. The invention addresses a manner for bringing both existing and newly developed technologies to

the user's attention in a user-friendly manner to boost the synergy and optimize the use of the user's equipment, thus contributing to a "green" environment.

Consider, for example, a home network comprising a PC, equipment based on the HAVi and Home API concept, and comprising an intelligent universal programmable remote controller, such as the "Pronto" of Philips Electronics. In addition, the home network is connected via the Internet to a server that keeps a cumulative data base of hardware and software features commercially available for consumer electronics and home automation devices/services. Now, there is information about the home network's profile (its devices, their capabilities and their functionalities) and intelligence at various places in the home system and beyond:

Information about the network's profile resides in the following places: the remote (since it has the GUI and control codes for at least the IR-controllable part of the equipment), the PC (that has the "Directory" look up service for the Home API configuration), the FAV in the HAVi part of the network that has the "Registry", and possibly the server if it is also used as described in U.S. Serial No. 09/160,490 (Attorney Docket PHA 23,500) filed 9/25/98 for Adrian Turner et al. for "CUSTOMIZED UPGRADING OF INTERNET-ENABLED DEVICES BASED ON USER-PROFILE" as mentioned above and incorporated herein by reference. In the latter patent document, a server system maintains a user profile of a particular end-user of consumer electronics network-enabled equipment and a data base of new technical features for this type of equipment. If there is a match between the user-profile and a new technical feature, and the user indicates to receive information about updates or sales offers, the user gets notified via the network of the option to obtain the feature.

Intelligence (data processing capabilities) resides in the following places: the PC, the intelligent remote and the server system.

Now, when the remote gets programmed to include an additional control function (e.g., a new apparatus) an application program local to the remote control gets activated to suggest via its GUI to the user new interaction possibilities based on pre-defined and pre-installed scenario's to choose from. When a new functionality has been installed on the network the PC starts an application seeking out the possibilities for new synergies. The user may have activated the program him/herself or, alternatively, the program may have been activated by the new functionality being detected by the system (e.g., through the Home API Directory). The program notifies the user of possible new synergies in any convenient manner or in a pre-programmed manner. When a possibility arises for a synergy based on newly



marketed software or hardware items, and the office / home network comprises an Internet-enabled device, the server can notify the user, based on the inventory or profile of the user's network and his/her preferences. Examples are given below with reference to the drawing.

5

The invention is explained in further detail, by way of example and with reference to the accompanying drawings, wherein:

Fig.1 is a block diagram of a system in the invention;

Fig.2 is a flow diagram of a method in the invention; and

10 Fig.3 is a block diagram of another system in the invention.

Throughout the figures, same reference numerals indicate similar or corresponding features.

15

Fig.1 is a block diagram of an information processing system 100 in the invention. System 100 comprises multiple CE devices of an end-user, such as a set-top box 102 (e.g., the WebTV of Philips Electronics), a TV receiver 104, a home entertainment sub-system 106 (e.g., the DVX8000 of Philips Electronics), and a PDA 108 (e.g., the Nino of Philips Electronics that has a wireless transceiver). Set-top box 102 comprises a device that enables television set 104 to become a user interface to the Internet. Set-top box 102 contains a Web browser (i.e., a Hypertext Transfer Protocol client) and the Internet's main program, TCP/IP. Set-top box 102 is connected to a service 110, e.g., through a telephone line as, for example, with WebTV. TV receiver 104 is connected to a data and video delivery service 112 such as contemplated by, e.g., the company TiVo. This start-up company has developed a data and video delivery service for a VCR that allows digital recording from TV scan for programs based on user preferences and enables customized ad delivery. The DVX8000 sub-system 106 is connected to an ISP or ISDN network 114. PDA 108 communicates via a wireless network 116 with other PDA's (not shown), with laptops (not shown), etc. Each of devices 102-108 is enabled to communicate via the Internet 118.

25  
30

System 100 further comprises as a back-end architecture a registration server 120, a user-profile data base 122, a feature data base 124 and a feature management server 126. Server 120 registers user preferences of devices 102-108. Preferences may be explicitly supplied by the end-user in order to be registered at server 120 and/or implicitly derived from, e.g., a user-profile gradually built-up through relations with the hardware and/or service

provider. User-preferences relate to, for example, context of use (e.g., profession, hobbies, home, office, hotel, school, college, airport, shopping mall), device characteristics, user-needs. Registration server 120 passes on to user-profile data base 122 the information about each particular end-user registered. Feature data base 124 contains information about new features, services and devices and is being kept up-to-date by the service provider, e.g., the manufacturer(s) of devices 102-108. For each particular end-user registered, feature management server 126 associates the user-profile as stored in data base 122 with features, devices and services, information about which is made available through feature data base 124 in order to notify the end-user of new features, devices or services, items on-sale, etc., that are likely to be of interest to the end-user given his/her profile. For example, server 126 notifies the end-user of new releases of software included in one of more of devices 102-108 in order to have these devices upgraded if and when desired and via, e.g., the Internet. The information about end-user's equipment 102-108 and their configuration is available through user-profile data base 122. As another example, server 126 notifies the end-user of new functionalities in terms of software applications and/or hardware components that can be added to one or more of devices 102-108 by way of upgrade. For example, assume that a new voice recognition software program and a voice input/output module have become available for one or more of devices 102-108. Since this end-user has been registered as owning devices 102-108, server 126 notifies this end-user of the possibility to have his/her equipment upgraded. The user may order the software and hardware modules through the Internet. He/she gets the software downloaded automatically if and when desired via the Internet. The hardware module is being shipped to the end-user together with clear instructions how to add this module to his/her equipment 102-108. Alternatively, or subsidiarily, server 126 also provides an online help desk for assisting the end-user with installing the new components. In this manner, an end-user's device has become a flexible repository into which the consumer/end-user can place new and exciting features over time. Since the notification is user-profile controlled, the end-user is enabled to customize his/her equipment in a guided manner. As another example, the end-user has specified a certain log-in shield when turning on a particular device or service, e.g., PDA 108. See for example, U.S. application Serial No. 09/151,578 (Attorney docket PHA 23,496) "CONTEXT SENSITIVE LOG-IN SHIELD" of Bart de Greef, filed 09/11/98, and incorporated herein by reference. This reference relates to a login shield that controls access to a computer, a network system or another information processing system. The login shield provides for the selection of context and application options. At login, the user has the option to identify a context, from which the login shield identifies an initial workspace or set

of workspaces. The login shield prompts the user for identification information and compares the identification information to a set of authorized users. If a match is found, the login shield establishes the initial workspace and launches the selected applications. The user is also provided a means to create and define alternative contexts for selection at login. By allowing  
5 the user to define and select among alternative contexts at the start of the login process, the overhead associated with the login process can be minimized to that required for each particular user context. Once this login shield has been specified for device 108, the user can specify that other devices 104-106 be set via server 126 to also provide a similar login shield. Thus, and in general, user-preferences can be transferred to other network-enabled devices of  
10 the end-user, and to future network-enabled devices when the user has connected them to the network.

Preferably, devices 102-108 enable the user to contact the back-end architecture (servers 120 and 126) through a consistent UI, e.g., a standardized GUI on a display of one or more devices 102-108 or on a remote control, e.g., the programmable universal remote  
15 controller "Pronto" of Philips Electronics, which has an LCD with a resolution high enough for this purpose. Preferably, the UI provides a standardized single key to start with a single touch communication with the back-end architecture in order to simplify user-interaction and to motivate users to enquire about what is new and available to them. If there is more than one user for equipment 102-108 further information processing may be necessary for selective  
20 personalization.

Fig.2 is a flow diagram 200 illustrating various aspects of the method according to the invention.

In step 202, the user-profile, or its update as the case may be, is registered with registration server 120. For example, registration is done explicitly by the user by providing  
25 information about context of use, device characteristics, personal interests, etc. Alternatively, or subsidiarily, the registration is accomplished automatically upon the user connecting the equipment to network 118 for the first time or since a particular time interval has elapsed. In the latter case, registration is limited to device characteristics and possibly the site through a device identifier and site identifier. In step 204, server 120 stores the profile or its update in  
30 data base 122. In step 206, feature server 126 queries feature data base 124 in order to determine if the user as registered should be notified of a new feature that fits in with his/her registered equipment given his/her profile. Upon finding such a match in step 208, feature server 126 notifies the user of this feature in step 212 when the user has logged in on server system 120-126, e.g., through a specific one-button action at his/her equipment 102-108 in

step 210. If the user decides in step 214 not to take advantage of this offer, the process returns to step 202 to update the user's profile in data base 122 with the information that this specific user is not interested in the feature found. If the user decides in step 214 to take advantage of the offer he/she gets, in step 216, the feature downloaded via network 118 if the feature is a software-controlled functionality or gets a notification that the feature will be shipped in case it comprises hardware. The process returns to step 202 for updating this user's profile with the information that he/she is interested in the feature found.

Fig. 3 illustrates another aspect of the invention in a client-server system 300 with an end-user's home network 302 as a client and with a server system 304 similar to the components 120-126 discussed above. According to the method of the invention, profiles 306 of the end-user, of devices on home network 302 and of software applications available on network 302 are stored in data base 122. Profiles 302 can be encapsulated as database records, software objects (e.g., in an architecture based on Jini, HAVi, Home API, or CORBA), etc. Data base 124 stores information on features (e.g., devices, applications, services, but also content) available for a home (or office) network. Data base 124 stores, for example, a list of commercially available network-compliant CE software and hardware components, pricing, promotional information and other information (e.g., manuals), preferably for a variety of architectures. Server 126 determines which hardware or software components (applications/services) can be used on the end-user's network 302, given the user's profile, his/her preferences, and the profile of home network 302, in order to boost the synergy of the components already present on network 302. If it has been decided that there is a match between profiles 306 as stored in data base 122 and one or more of the information items stored in data base 124, the user gets notified, e.g., via the Internet, of the option to obtain the feature for being added to his/her equipment. If the user accepts the offer, the feature, e.g., a software application or a content data service, is pre-configured for the user's system 302. For example, the control codes for UI, the IR an/or RF control codes, the software components, static graphics, animations, etc., are packaged. The user could also allow server 126 or a third party service to conduct modifications on his/her behalf. In case the feature relates to new software, it can be downloaded via the Internet for, preferably automatic, installation on network 302. In case the feature comprises a hardware component, it can be shipped to the end-user upon acceptance of the offer. A helpdesk is preferably provided through the Internet to help the end-user install the feature. A facilitating software agent can be provided with the feature. The agent can be customized according to the user profile (Large fonts, hints, jokes, technical advice, etc.). The above is clarified with reference to the following examples:

Assume that the user's network 302 comprises a TV set 308 and a VCR 310 and that the network profile in data base 122 indicates so. The user may then be interested in having installed an Electronic Program Guide (EPG) 312. If network 302 has, in addition, a Software/Hardware Timer object 314 plus control options to control TV 308 and VCR 310 through a home network 316, and the network profile indicates so, the user may be interested in the combination of EPG 312 and a software application to automate the VCR's recording based on the time information provided by EPG 312 and triggered by Timer object 314 so that setting the VCR's clock is not required anymore.

The network customizing service may bring these additional functionalities to the user's attention. For example, system 300 has a one-click-connect function to connect client 302 of the user to the customizing service provider 304 in order to see if there is anything new under the sun that is interesting. The connection may trigger the "seek match" operation of feature server 126 so that the user has always access to the most current options. The customizing service may provide the necessary software and hardware items, e.g., by downloading or shipping. Alternatively, or supplementarily, the customizing service intermediates between the user and third parties who provide such software and/or hardware features. If the customizing service is tied to a large enough audience, third parties will be interested to team up with it and give the end-user a discount when purchasing or leasing the additional functionalities through the customizing service.

Assume that the user has registered his/her preferences with respect to certain TV programs and channels with data base 122 and that the user has a Personal Scheduler 318 that is compliant with network 316, e.g., via PC 320. The combination of services can be enhanced by a software application that takes into account the user's calendar as provided by Scheduler 318. For example, if Scheduler 318 indicates that the user is busy at the time of a broadcast that falls within the user's preferred categories as indicated by his/her profile (e.g., interested in "National Geographic", '49-ers football games, "film-noir" movies, documentaries about astronomy), the software application enables VCR 310 to automatically record the program broadcasted.

Assume that network 316 is Home API- or Jini-compliant with a PC 320 or a set top box (not shown). Assume further that the user has a "Pronto" universal programmable remote control device 322. The user may then authorize the provider 304 of the customizing service to retrieve information about the physical location of various apparatus on network 316 from the HomeAPI/HA Vi/Jini directory, e.g., devices having a UI in the living room, in the study, in the kitchen, in the bedroom, in the garage, etc. The service provider then creates a

data base for the GUI of universal remote controller 322: GUI pages with control options clustered per location. Navigation through the control options is made more ergonomic and user-friendly by clustering them according to the locations where the user can be residing to interact with the devices. The data base is transferred, e.g., via the Internet or telephone, from server 126 to PC 320 (or to the set-top box) from where remote controller 322 can be programmed accordingly. If the user adds a device to network 316 or removes a device from network 316, the Registry/Directory/look-up service gets modified. A software module may be of interest to the user for translating these modifications into event notifications in order to prompt the user to upgrade the remote control GUI via the Internet or telephone.

Assume that the user installs a new DVD player 324 on the network. Server 120 gets notified and looks for new DVD's matching the user's profile, possibly making available promotional previews by downloading excerpts to the user's PC or set top box. The user is offered a subscription to purchase or lease DVD's.

Assume that the user indicates a certain desire, either directly to server 120 or indirectly inferred through user-profiling. Assume that the user desires, e.g., faster response time from an Internet service or more data faster downloadable via the Internet. The user may then be interested in having a higher bandwidth device installed on his/her net 316 to enable certain types of content streaming (video, audio, etc...).

As another example, consider a "Missing Devices" approach: The user is offered to enable scenarios by purchasing or leasing equipment, software, bandwidth, content, etc. For example, the user's universal programmable remote, the "Pronto", is in essence capable of interacting with not only available IR-controllable equipment, but also RF, 1394, USB, etc. controllable devices through the home network HomeAPI/HA Vi/Jini, etc. The components that are missing are an IR receiver to attach to the controller (PC, set-top box, etc.), such as the Web-Eye of the WebTV from Philips Electronics, software components that translate Pronto commands to be interpretable by these other devices, GUI elements (pages) to present to the user via the Pronto's touch screen. Again, by having an inventory of available capabilities at the user's home or office equipment, a service provider is able to come up with proposals to enhance the synergetic aspects of the user's equipment so that it becomes tailored to the individual user's wishes.

## CLAIMS:

1. A method of enabling customizing a network (302) of a user, the method comprising:
  - determining a profile of the network;
  - determining (206) information about an item for use with the network;
  - 5 - determining (208) if the item is relevant to the user based on the network profile; and
  - if relevant, enabling notifying the user of the option to select the item for being installed on the network.
2. The method of claim 1, wherein:
  - 10 - the network comprises multiple components (308-324) connected through the network; and
  - the customizing comprises modifying a synergy of the components.
3. The method of claim 1, wherein the method further comprises:
  - receiving (202) a profile of the user;
  - 15 - determining if the item is relevant to the end user based on the user's profile item for being installed on the network.
4. The method of claim 3, wherein:
  - the network comprises multiple components connected through the network; and
  - 20 - the customizing comprises modifying a synergy of the components.
5. The method of claim 1, wherein:
  - the network has Internet access (320-118);
  - the item comprises a software feature; and
  - 25 - the method comprises downloading the software feature in the network via the Internet.
6. The method of claim 1, wherein:
  - the network has Internet-access (320-118);
  - the item comprises an Internet service; and

- the method comprises providing the service.

7. The method of claim 1, wherein the item comprises a cable service.

5 8. The method of claim 1, further comprising offering the item for lease.

9. The method of claim 1, wherein the profile is determined at least partly by consulting a look-up service on the user's network.

10 10. The method of claim 9, wherein the look-up service comprises a Registry of a HAVI-compliant portion of the user's network.

11. The method of claim 9, wherein the look-up service comprises a Directory of a Home-API compliant portion of the user's network.

15

12. The method of claim 9, wherein the look-up service comprises a look-up service of a Jini-compliant portion of the user's network.



1/3

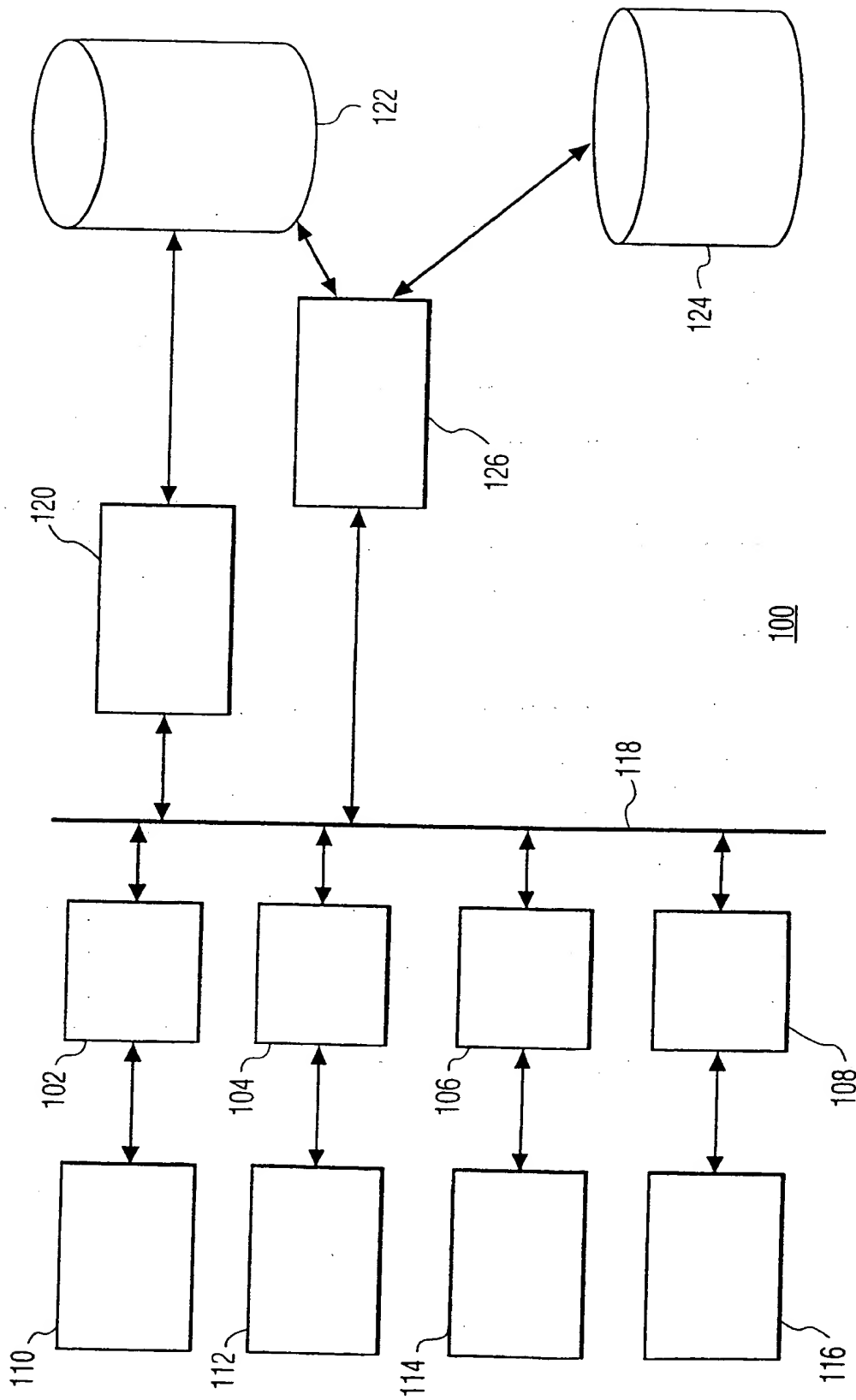
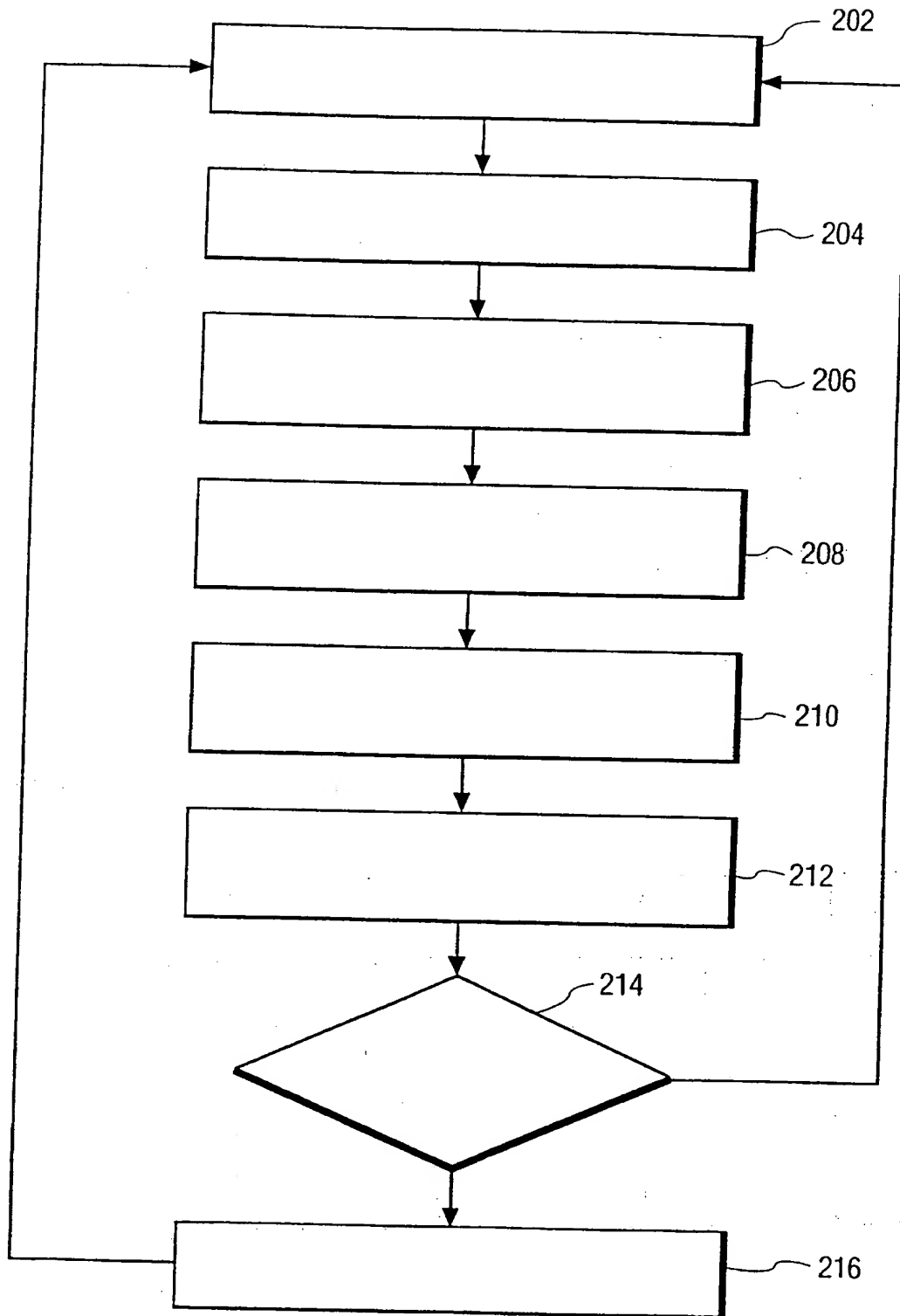


FIG. 1

2/3



200

FIG. 2

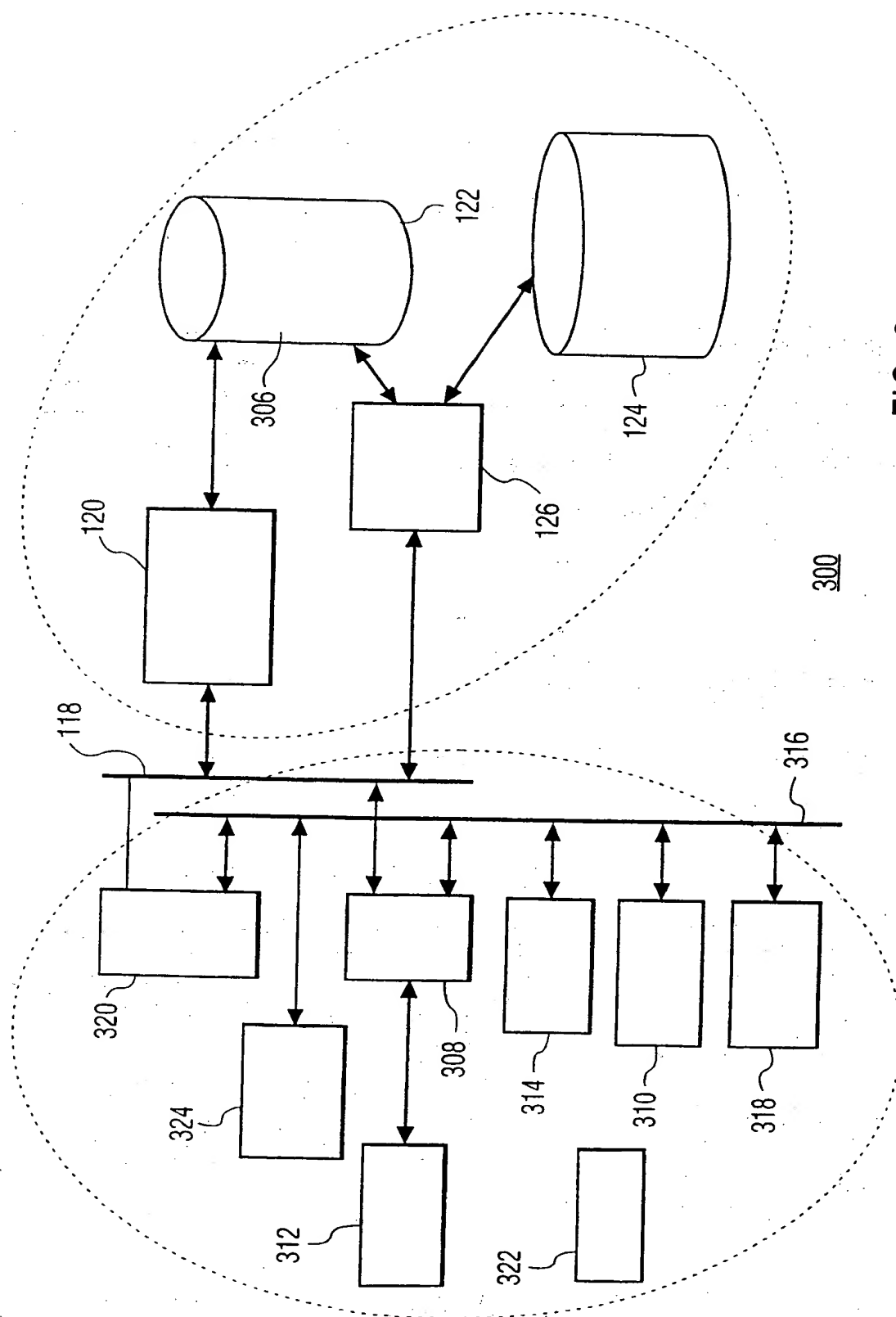


FIG. 3

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 99/08332

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06F17/30

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	MARGOLIN B: "SMARTER STUFF" BYTE, US, MCGRAW-HILL INC. ST PETERBOROUGH, vol. 22, no. 6, 1 June 1997 (1997-06-01), pages 85, 87, 89, 91-92, XP000691560 ISSN: 0360-5280 page 89 Paragraph: Fun with Internet Appliances	1-12
A	CHILD J: "INTELLIGENT HOME TECHNOLOGY LOOKS FOR LEVERAGE FROM RELATED MARKETS" COMPUTER DESIGN, US, PENNELL PUBL. LITTLETON, MASSACHUSETTS, vol. 36, no. 12, 1 December 1997 (1997-12-01), pages 85-87, XP000754856 ISSN: 0010-4566 the whole document	1-12

-/-

☒ Further documents are listed in the continuation of box C.

☐ Patent family members are listed in annex.

### \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

2 March 2000

Date of mailing of the international search report

10/03/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+31-70) 340-3016

Authorized officer

Katerbau, R

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 99/08332

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>EVANS G: "CEBus. Defining the future of residential communications"            AUSTRALIAN ELECTRONICS            ENGINEERING, AU, THOMSON BUSINESS            PUBLISHING, CHIPPENDALE,            vol. 30, no. 3, March 1997 (1997-03),            pages 34-36, 38-36, 38, XP002105591            ISSN: 0004-9042            the whole document</p>	1-12